Evolution and Society
Course Syllabus

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Catalogue Description

The science of evolution has come a long way since Charles Darwin first proposed his theory for how species change through natural selection in 1859. This course will provide an overview of modern evolutionary biology, with a focus on its relevance for 21st century society.

Course Overview

This course provides an overview of the modern science of evolutionary biology, with a focus on the relevance of evolution for everyday life. Examples include the evolution of antibiotic-resistant bacteria, the controversy surrounding teaching evolution in schools, and the relationship between evolution and religion. Pre-class readings will provide background information for in-class discussions. Students will select one topic for further exploration, resulting in a written essay and an oral presentation to the class.

Student Learning Objectives

By the end of this course, students will be expected to:

1) demonstrate a working knowledge of basic evolutionary biology;
2) understand the relevance of evolution to modern society;
3) demonstrate the ability to effectively communicate about the science of evolution in written and oral formats.

Assignments and Grading

Essay - topic – short description of the proposed topic for the course essay:	5 points
Essay - outline – detailed outline and bibliography for the course essay:	20 points
Essay - draft – complete rough draft of course essay:	50 points
Essay – final – complete, polished version of course essay:	100 points
Presentation – short oral presentation about essay topic:	25 points
Participation in class discussions:	100 points
Total:	**300 points**

Schedule (subject to change)

Class 1: **Only a Theory**. Evolution has been dismissed as being "only a theory." We will consider the scientific meaning of "theory," and the nature of scientific inquiry.

Class 2: **Darwin's Idea**. The publication of On the Origin of Species was a landmark event in the history of science. We will consider the ideas and events that led to this publication, the basic ideas proposed, as well as the reaction it received after publication. *Essay topic due*

Class 3: **Eugenics**. Applying evolutionary principles to humans led some to the belief that humanity was evolving in an undesirable direction and that efforts should be made to correct it. We will explore the development of this misguided idea and some of the atrocities that were carried out under the guise of evolutionary science. *Essay outline due*

Class 4. **Evolution on Trial**. We consider the evidence in support of evolution and the controversy around the teaching of evolution, from the Scopes trial in 1925 up to modern debates and legal challenges.

Class 5. **Evolution and Religion**. We consider the relationship between the modern science of evolution and religion, including whether they represent compatible worldviews.

Class 6. **Evolution and Agriculture**. The domestication of plants and animals is a prime example of how selection operates, and evolutionary principles also can help develop new strains of crops and livestock. *Essay draft due*

Class 7. **Evolution and Medicine**. We consider the relevance of evolution to understanding the causes of human disease, as well as the challenges posed by the evolution of antibiotic resistance in bacteria. *Student presentations*

Class 8. **Evolution, Conservation, and Climate Change**. We consider how understanding evolution helps inform conservation and how climate change may threaten species that do not adapt. *Student presentations*

Class 9. **Human Evolution—the First 5 Million Years**. We will review the fossil and genetic evidence for human evolution including several amazing recent discoveries. *Student presentations*

Class 10. **Evolution and Race**. What does evolutionary biology tell us about the existence of human races? We review the latest evidence from human evolutionary genetics and its implications for the existence of race. *Student presentations*

Class 11. **Human Evolution in the 21st Century and Beyond**. We will consider the evidence suggesting that human evolution is ongoing and what can be predicted about our evolutionary future. *Final essays due*

Reading

Required texts (all enrolled students should acquire a copy):

Losos, J. B., and Lenski, R. E. (2016) *How Evolution Shapes Our Lives: Essays on Biology and Society* Princeton University Press, Princeton.

Zimmer, C. and Emlen, D. J. (2016) *Evolution: Making Sense of Life, 2nd edition* Freeman, New York.

The following texts will be made available as pdfs:

Kitzmiller v. Dover Area School District (2005) 400 F. Supp. 2d 707 - Dist. Court, MD Pennsylvania.

Kolbert, E. "There's No Scientific Basis for Race—It's a Made-Up Label," *National Geographic*, April 2018.

Mueller, U. G., Gerardo, N. M., Aanen, D. K., Six, D. L., & Schultz, T. R. (2005) "The evolution of agriculture in insects" *Annual Review of Ecology, Evolution, & Systematics* 36, 563-595.

Wallis, C. "The Evolution Wars" *Time* August 15.

Optional Additional Reading:

Comfort, N. (2012) *The Science of Human Perfection: How Genes Became the Heart of American Medicine* Yale University Press, New Haven.

Darwin, C. (1859) *On the Origin of Species by Means of Natural Selection*. Murray, London.

Darwin, C. (1888) *The Descent of Man and Selection in Relation to Sex* Murray, London.

Dawkins, R. (1986) *The Blind Watchmaker: Why the Evidence of Evolution Reveals a Universe without Design* Norton, New York.

Dugatkin, L. and Trut, L. (2017) *How to Tame a Fox (and Build a Dog): Visionary Scientists and a Siberian Tale of Jump-Started Evolution* University of Chicago Press, Chicago.

Hölldobler, B., & Wilson, E. O. (2010). *The Leafcutter Ants: Civilization by Instinct* Norton, New York.

Mukherjee, S. (2016) *The Gene: An Intimate History* Scribner, New York.

Quammen, D. (2007) *The Reluctant Mr. Darwin: An Intimate Portrait of Charles Darwin and the Making of his Theory of Evolution* Norton, New York.

Ryan, M. J. (2017) *A Taste for the Beautiful: The Evolution of Attraction* Princeton University Press, Princeton.

Scott, E. C. (2009) Evolution Vs. Creationism: An Introduction, 2nd edition. University of California Press, Oakland.

Solomon, S. (2016) *Future Humans: Inside the Science of Our Continuing Evolution* Yale University Press, New Haven.

Weiner, J. (2014) *The Beak of the Finch: A Story of Evolution in Our Time* Vintage, New York.

Zimmer, C. (2018) *She Has Her Mother's Laugh: The Powers, Perversions, and Potential of Heredity* Dutton, New York.